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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,005	09/23/2005	Takahiko Kondo	01197.0257	5730
22852 7590 02/20/2007 FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413			EXAMINER CHANG, VICTOR S	
			ART UNIT 1771	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		02/20/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/550,005

Applicant(s)

KONDO ET AL.

Examiner

Victor S. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.  
4a) Of the above claim(s) 2,3 and 6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4,5 and 7-14 is/are rejected.
- 7) ☒ Claim(s) 5 and 7-13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/21/06, 7/27/06, 9/23/05</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Introduction***

1. New claim 14 has been entered.

### ***Election/Restrictions***

2. Applicant's election with traverse of the embodiment in claim 1 and a blend combination of three polyethylenes recited in claim 5 in the reply filed on 1/16/2007 is acknowledged. The traversal is on the ground(s) that the examiner has not listed features or reasons why the features are patentably distinct, and request a list of groups to explain why there is no single general inventive concept. This is not found persuasive because the list of embodiments has been listed, i.e., claims 1-3; and the list of blend combinations has also been listed, i.e., in claims 5 and 6. Since the claims are submitted by the applicants, there is no reason whatsoever that they are not available for applicants to comprehend the differences (features) in claimed limitations. Further, since there are distinct differences in the embodiments of the independent claims 1-3, and there is no evidence that these composition differences are nominal and these embodiments are in fact equivalent or obvious variants, each species is deemed to have unique special technical features not shared by other species. In summary, claims 1, 4, 5 and 7-14 are elected. Claims 2, 3 and 6 are withdrawn.

The requirement is still deemed proper and is therefore made FINAL.

### ***Claim Objections***

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3. Claims 5 and 7-13 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim.

See MPEP § 608.01(n).

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 4, 5 and 7-14 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Takita et al. [US 6245272], and evidenced by Concise Encyclopedia of Polymer Science and Engineering, pp. 354.

Takita's invention relates to a microporous polyolefin membrane for use as a battery separator [abstract; col. 2, lines 48-60; col. 3, lines 1-27]. The microporous polyolefin membrane comprises a blend B of an ultra-high-molecular-weight polyolefin B-1 having a weight-average molecular weight of  $1.5 \times 10^6$  to  $15 \times 10^6$  and a polyolefin B-2 having a weight-

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average molecular weight of  $1 \times 10^4$  to  $1 \times 10^6$ . Preferably, the blend B contains 15 to 40 w% of B-1 to provide sufficient strength. Suitable polyolefins include crystalline homopolymers or copolymers of ethylene, propylene, or blends thereof, including high density polyethylene (HDPE), etc. Incorporation of propylene ethylene copolymer improves melt-down temperature and the characteristics of the membrane for battery separators.

For claims 1, 4, 5 and 13, Takita discloses a microporous polyethylene battery separator formed from a polyethylene blend. Takita is silent about: 1) the co-monomer ratio of a HDPE copolymer and its melt index (MI); 2) the viscosity average molecular weight (Mv) of a HDPE; 3) the Mv and co-monomer content in the blend. However, regarding item 1), since Takita teaches that suitable polyolefins include HDPE copolymer, and it is well known that a suitable amount of propylene is a common  $\alpha$ -olefin copolymerized with ethylene for forming a HDPE with controlled density and properties, as evidenced by the reference Concise Encyclopedia of Polymer Science and Engineering, clearly Takita's teaching encompasses the HDPE copolymer as claimed, and selecting a suitable propylene containing HDPE copolymer with a suitable MI as Takita's B-2 component is deemed to be either anticipated, or an obvious routine optimization to one of ordinary skill in the art of polymer blend, motivated by the desire to obtain the beneficial properties and melt processibility of a HDPE, including HDPE copolymer with a workable propylene content. Regarding item 2), since the viscosity average molecular weight Mv in claim 1 is a characterization of a HDPE blend of three molecular weight ranges (see claim 5, elected species), and since Takita teaches a HDPE blend formed from broad molecular weight ranges, which inherently encompasses smaller molecular weight ranges, forming a workable blend with a suitable Mv out of multiple smaller molecular weight ranges within the broader ranges taught

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by Takita is deemed to be either anticipated by Takita, or an obvious routine optimization, motivated by the desire to obtain beneficial properties and melt processibility of the HDPE blend. Finally, since the Mv values are deemed to be inherent properties of HDPE or blend of HDPEs, they are deemed to be inherently disclosed once a suitable blend of HDPE copolymer and ultra-high molecular weight HDPE are selected. Regarding item 3), since Takita teaches the same subject matter for the same use (microporous battery separator formed from a polyethylene blend), selecting a workable blend ratio of an ultra-high molecular weight HDPE B-1 and a HDPE copolymer B-2 with a suitable amount of propylene is deemed to be either anticipated by Takita, or an obvious optimization to one of ordinary skill in the art, motivated to obtain beneficial properties and melt processibility of a HDPE blend, including HDPE copolymer. In summary, despite of specific recited limitations, the instantly claimed invention fails to exclude the general teachings of Takita, because it fails to show how these specific limitations would have produced a distinct battery separator which is untenable by Takita's teachings.

For claims 7 and 8, since Takita teaches the same subject matter for the same use (microporous battery separator made of a polyethylene blend), workable rupture and shrinkage force of the battery separator are deemed to be either anticipated by Takita, or an obvious optimization to one of ordinary skill in the art of battery separator, motivated by the desire to obtain required properties dictated by end use.

For claim 9, since Takita teaches that a polymer capable of imparting a shut-down function at low temperature is included for lithium battery separators [col. 3, lines 58-61], a workable fusing temperature limit is deemed to be either anticipated by Takita, or an obvious

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optimization to one of ordinary skill in the art of a lithium battery separator, motivated by the desire to obtain a required safety feature for the end use.

For claim 10, Takita teaches that the final membrane has a thickness of 5 to 250  $\mu\text{m}$  [col. 6, line 20].

For claim 11, Takita teaches that the membrane has a porosity of 45 to 95% [col. 4, line 3].

For claim 12, Takita teaches that the membrane has an air permeability of 50 to 400 sec/100 cc [col. 4, line 55].

For claim 14, Takita teaches that blend B contains 15 to 40 w% of B-1 to provide sufficient strength, and B-1 has a weight-average molecular weight of  $1.5 \times 10^6$  to  $15 \times 10^6$ . Further, a low-density polyethylene is incorporated to impart a shut-down function for the battery separator. The low-density polyethylene (LDPE) useful for the present invention includes ethylene/ $\alpha$ -olefin copolymer, etc. [col. 3, lines 13-20]. A suitable amount of LDPE is deemed to be either anticipated by Takita, or an obvious optimization to one of ordinary skill in the art of a lithium battery separator, motivated by the desire to obtain a required safety feature for the end use.


### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor S. Chang whose telephone number is 571-272-1474. The examiner can normally be reached on 8:30 - 5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel H. Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Victor S Chang  
Examiner  
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2/9/2007